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PROBLEMS FOR SOLUTION.

ARITHMETIC.

126. **Proposed by G. B. M. ZERR, A.M.. Ph.D., Professor of Mathematics and Science, Chester High School, Chester, Pa.**

Bought 150 head of stock for \$300, paying for each kind \$$2\frac{5}{6}$, \$$1\frac{5}{8}$, and \$$\frac{5}{7}$, respectively. Find number of each kind bought.

127. **Proposed by P. S. BERG, A. M., Principal of Schools, Larimore, N. D.**

A man borrows \$1000 of a Building and Loan Association, and at the same time subsubscribes for 10 \$100-shares of stock. A membership fee of \$1 per share is charged. At the beginning of each month an installment of \$1 per share is paid, also 5% interest and 5% premium on the \$1000. The stock matures in 75 months and the debt is cancelled. What rate of interest does he pay per annum ?

⁂ Solutions of these problems should be sent to B. F. Finkel not later than April 10.

GEOMETRY.

138. **Proposed by JOHN M. HOWIE, Professor of Mathematics, The Nebraska State Normal, Peru, Neb.**

K is the middle point of any chord AB of a given circle. CD and EF are any two chords passing through K. CF and ED intersect AB at M and N, respectively. Prove that KM equals KN.

139. **Proposed by B. F. FINKEL, A. M., M. Sc., Professor of Mathematics and Physics in Drury College, Springfield, Mo.**

If $x^2+y^2=1$ [x and y being points corresponding to complex numbers], prove that x and y are at the ends of conjugate radii of an ellipse whose foci are ± 1. [From *Harkness and Morley's Introduction to the Theory of Functions.*]

140. **Proposed by J. OWEN MAHONEY, B. E., M. Sc., Professor of Mathematics, Central High School, Dallas, Tex.**

Having given two points on a range and a point that bisects the distance between two other points that form an harmonic ratio with the given points, give, if possible, a geometrical construction for locating the other two points.

⁂ Solutions of these problems should be sent to B. F. Finkel not later than April 10.

MECHANICS.

103. **Proposed by G. B. M. ZERR, A.M., Ph.D., Professor of Mathematics and Science, Chester High School, Chester, Pa.**

Given the lengths a, b of the sides of a parallelogram, the direction of side a, and the position of the centroid. Prove that the locus of the foci of the ellipse of gyration at the centroid is a Cassinian Oval, having its foci distant $a/2\sqrt{3}$ from the centroid, and the constant product of its focal distances equal to $\frac{1}{12}b^2$.

104. **Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in Irving College, Mechanicsburg, Pa.**

From a locomotive and tender standing still on a bridge, the pressure on the bridge is $p_1=80$ tons. The track is supposed to be straight and practically horizontal. Had the locomotive and tender been running at the rate of $r=60$ miles an hour, how many tons would the pressure on the bridge have been?

⁂ Solutions of these problems should be sent to B. F. Finkel not later than April 10.

AVERAGE AND PROBABILITY.

91. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Mathematics and Science, Chester High School, Chester, Pa.

Six points A, B, C, D, E, F are taken at random on the surface of a sphere. Find the chance that the plane through A, B, C intersects the plane through $D, E. F$ within the sphere.

92. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in Irving College, Mechanicsburg, Pa.

A circular field, radius r, is divided into four *equal* parts, by concentric circles and three concentric rings. From the center of this field are fired *at random*, and with such a velocity as not to produce a range greater than the radius of the field, $m=1000$ projectiles of the *same* kind. How many projectiles should have fallen into each one of these four equal parts of the field?

⁂ Solutions of these problems should be sent to B. F. Finkel not later than April 10.

EDITORIALS.

Mr. W. D. Cairns has been appointed to an instructorship in mathematics in Oberlin College.

A fac-simile reprint of Legendre's Theorie des Numbers has lately been issued by A. Hermann, of Paris.

Among the lecturers before the students of the College for Women of the Western Reserve University, is Prof. E. S. Loomis, Teacher of Mathematics in the West High School of Cleveland, Ohio. Prof. Loomis's lectures are on Fundamentals in the Teaching of Arithmetic, and Essentials in Teaching Algebra.

BOOKS AND PERIODICALS.

Elements of Precise Surveying and Geodesy. By Mansfield Merriman, Professor of Civil Engineering in Lehigh University. 8vo. Cloth, 261 pages. Price, $2.50. New York: John Wiley & Sons.

The work begins with an elementary treatment of the method of least squares, developing the theory of the method in such an elegant and lucid way as to be clearly comprehended by a beginner. Many examples are solved to illustrate the various principles as they are developed. One not familiar with the Law of Probability of Error, and the Method of Least Squares and desiring to get a working knowledge of the subject needs this book. Chapter II treats of Precise Plane Triangulation in which is applied the Method of Least Squares for the correction of measured magnitudes; Chapter III treats of Base